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McVeen

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(54) **AUTONOMOUS VEHICLE TRANSPORATION SYSTEMS AND METHODS**

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G05D 1/00 (2006.01)
G05D 1/02 (2020.01)

(52) **U.S. Cl.**
CPC ***G05D 1/0088*** (2013.01); ***G05D 1/0229*** (2013.01); *G05D 2201/0212* (2013.01)

(58) **Field of Classification Search**
CPC G05D 1/0088; G05D 1/0229; G05D 2201/0212; B64C 2201/00; B64C 2201/20; B61J 1/06; B61B 12/127; B60Y 2200/25; B61K 5/04; B61L 1/02; B65D 2590/0033
See application file for complete search history.

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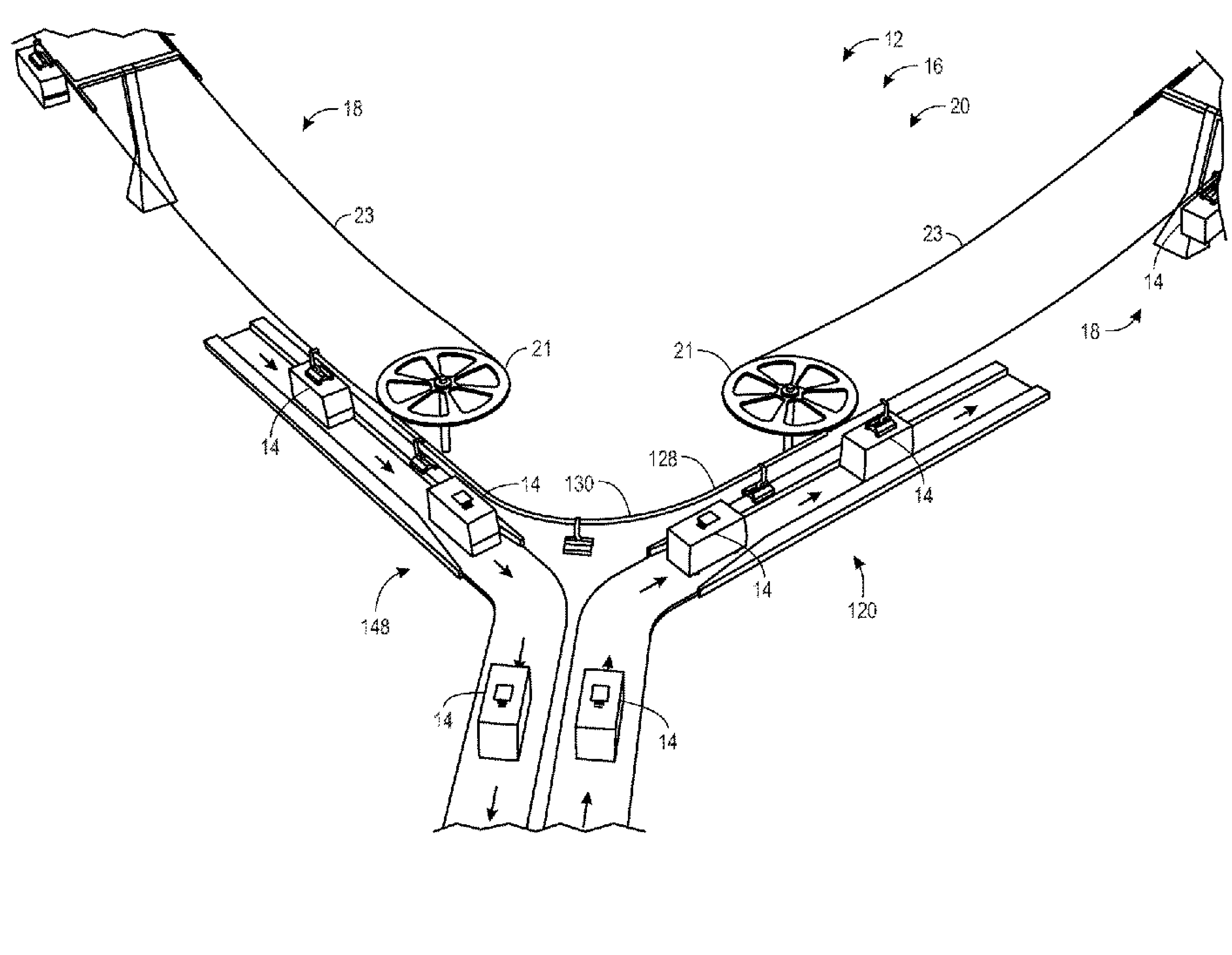
(57) **ABSTRACT**

An amusement park system in accordance with present embodiments includes multiple separated park areas, an autonomous vehicle configured to drive along ground surfaces within the multiple separated park areas, and a gondola system configured to transport the autonomous vehicle between the multiple separated park areas. The amusement park system further includes a control system configured to operate the autonomous vehicle to engage with and disengage from the gondola system to facilitate transport of the autonomous vehicle by the gondola system.

13 Claims, 12 Drawing Sheets



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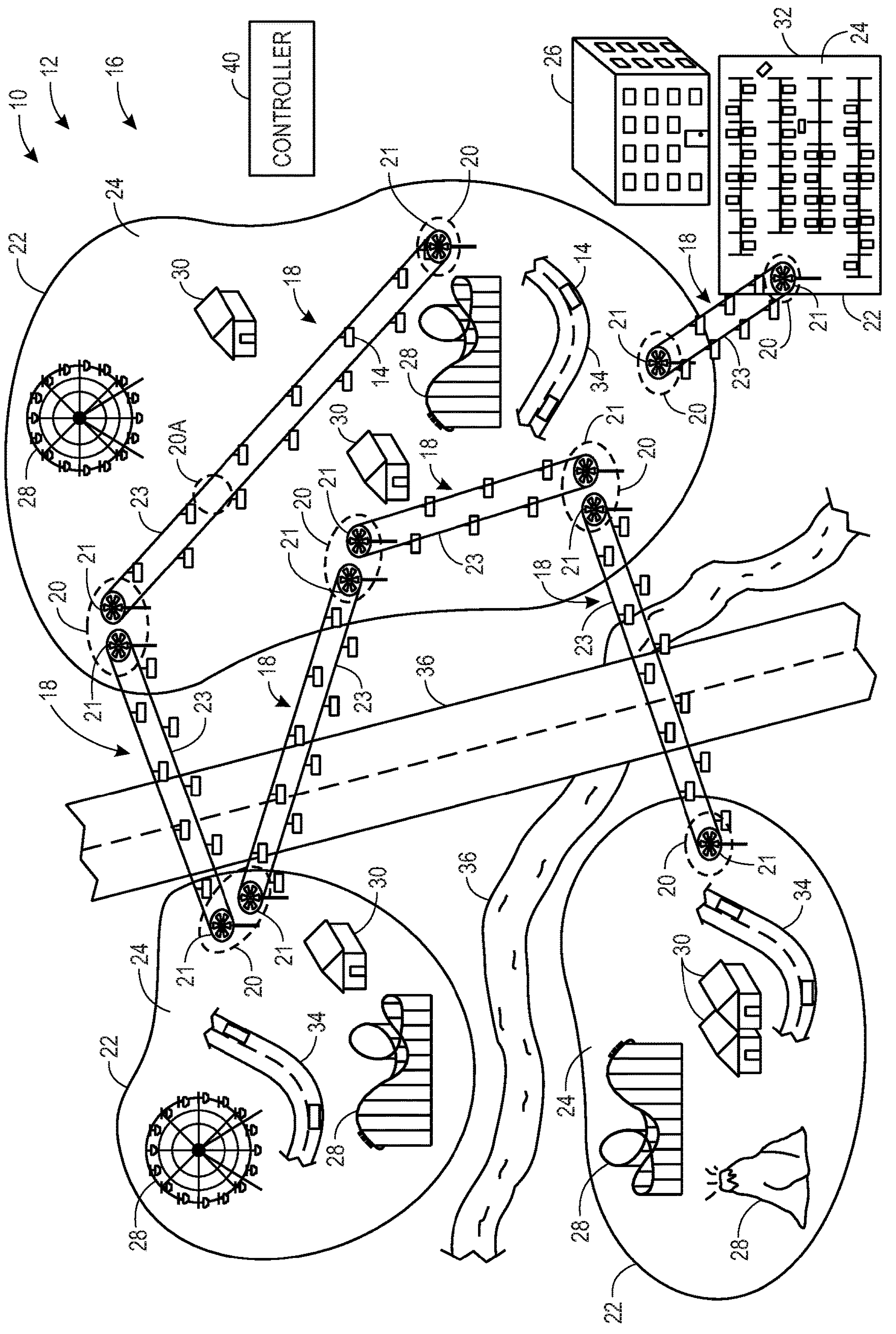
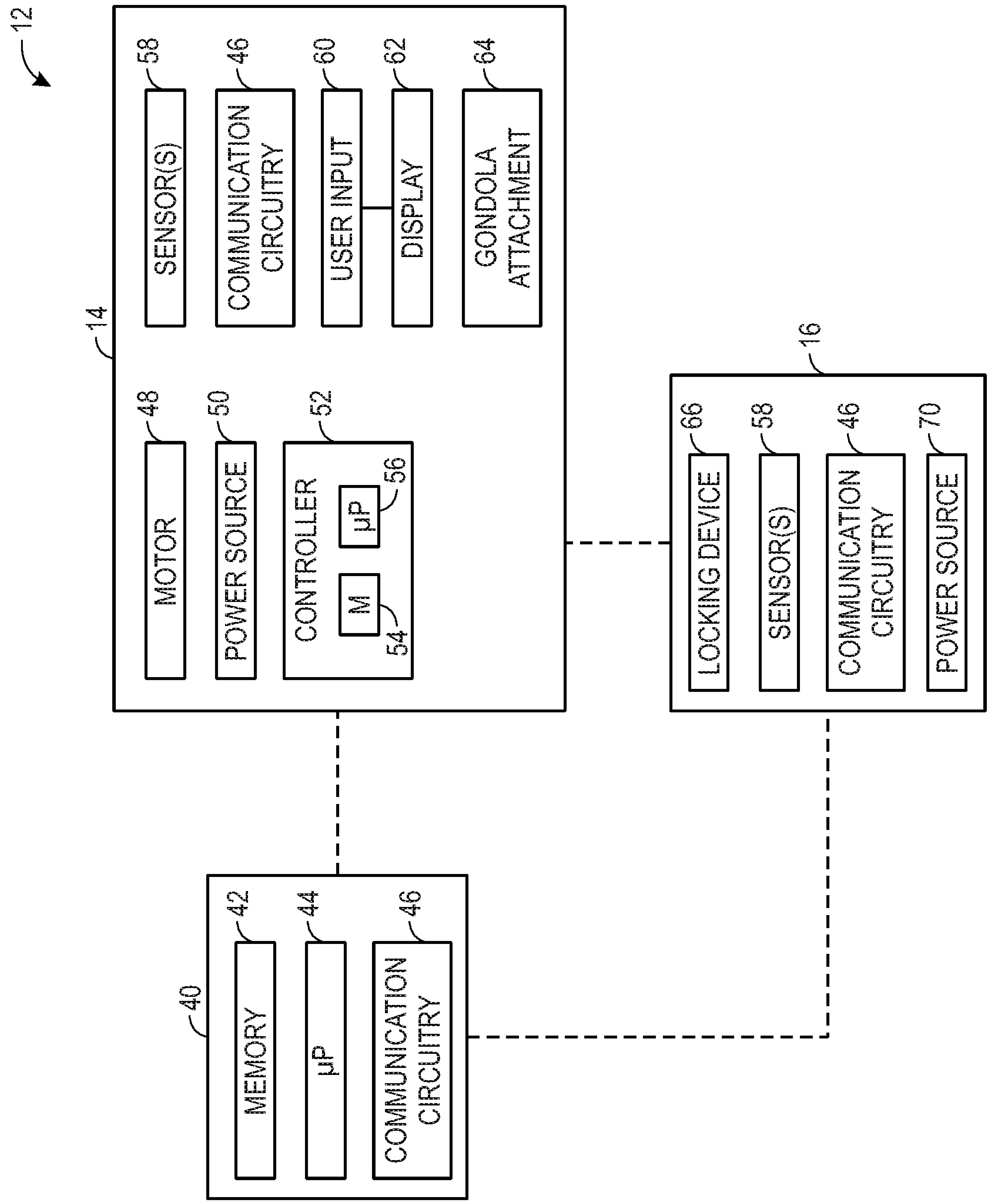


FIG. 1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SENSOR(S)
58
COMMUNICATION CIRCUITRY
46
USER INPUT
60
DISPLAY
62
GONDOLA ATTACHMENT
64
MOTOR
48
POWER SOURCE
50
CONTROLLER
52
M
54
µP
56
16
LOCKING DEVICE
66
SENSOR(S)
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COMMUNICATION CIRCUITRY
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POWER SOURCE
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MEMORY
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COMMUNICATION CIRCUITRY
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FIG. 2

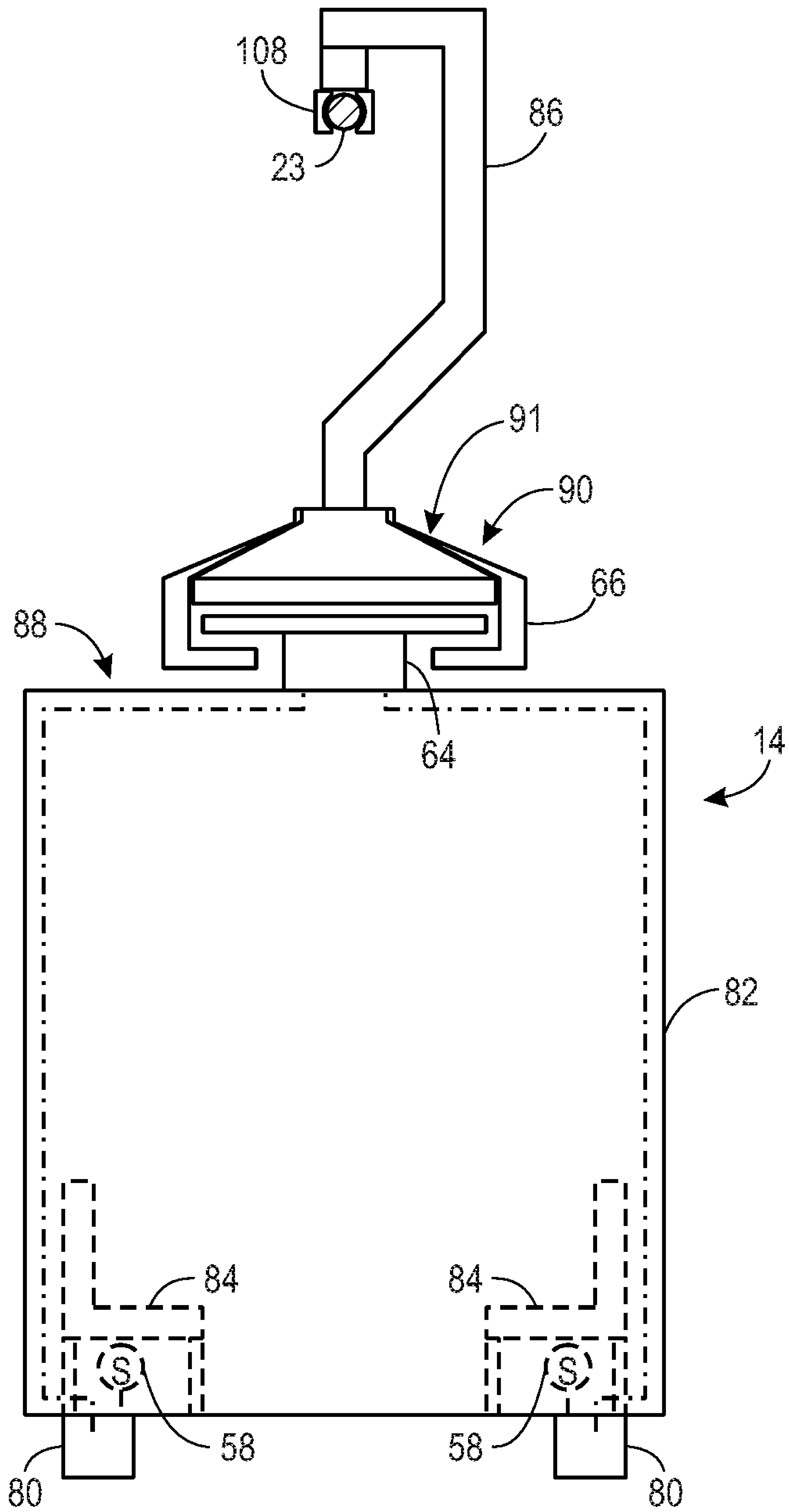

FIG. 3

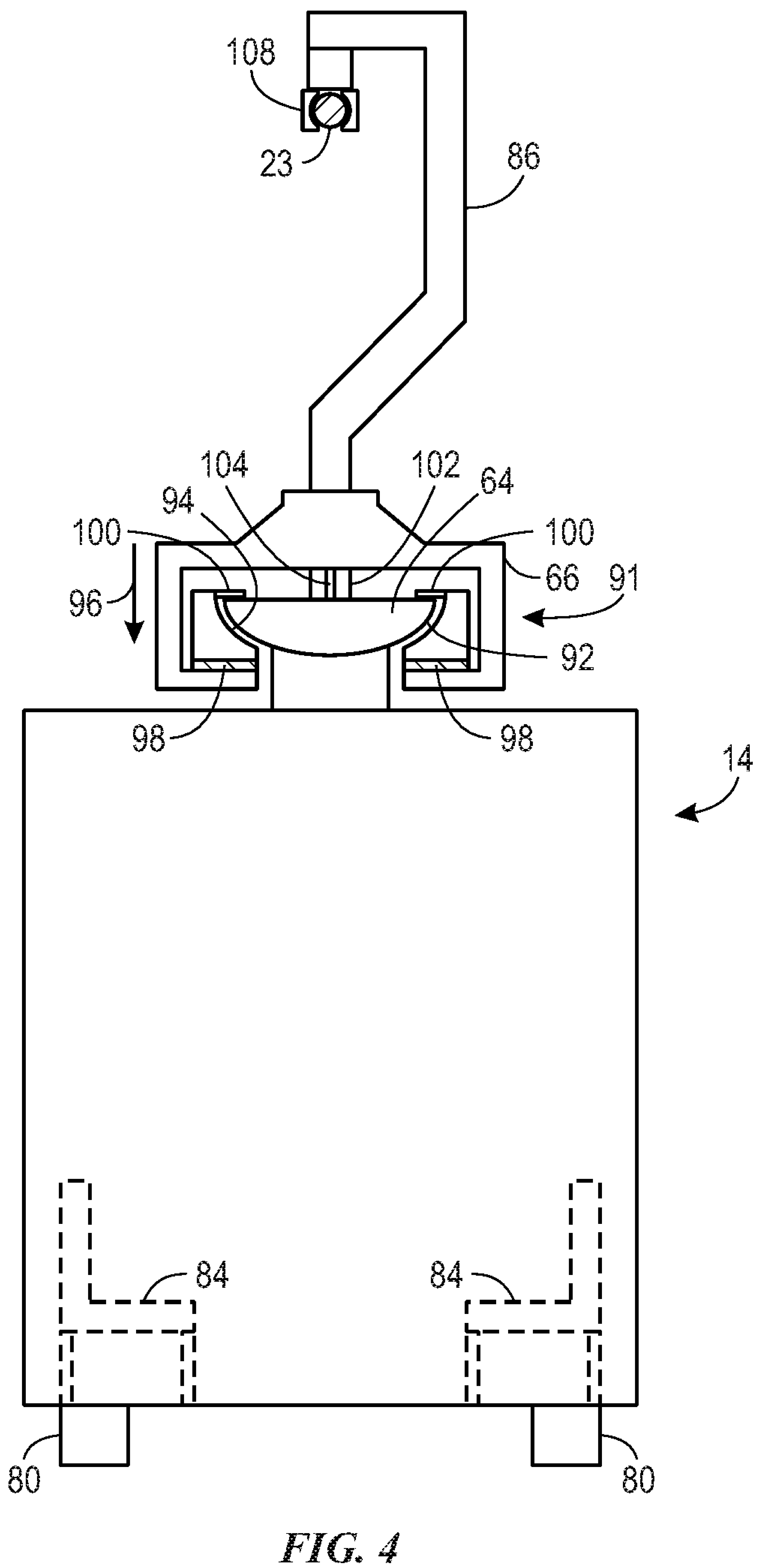

FIG. 4

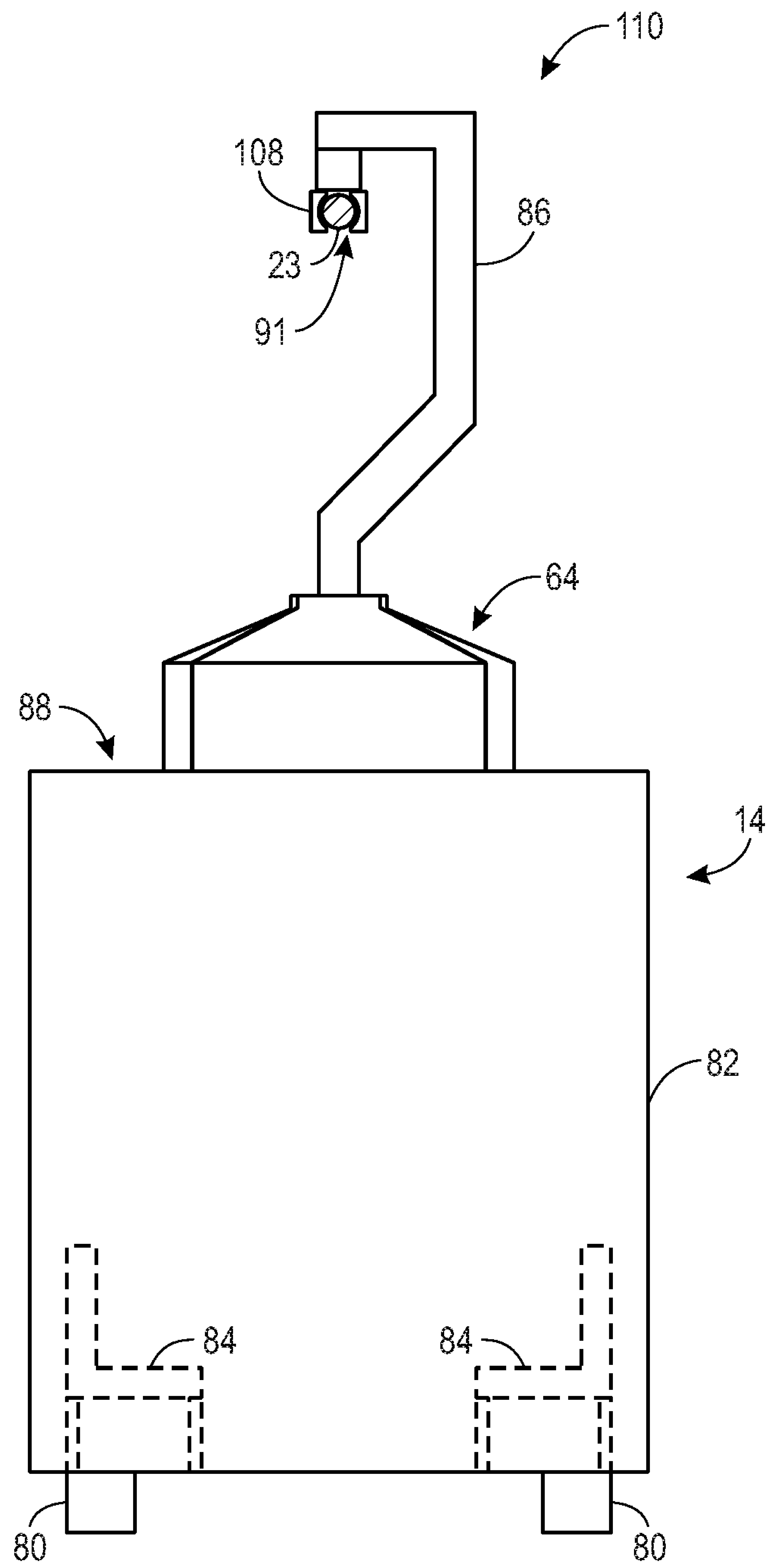

FIG. 5

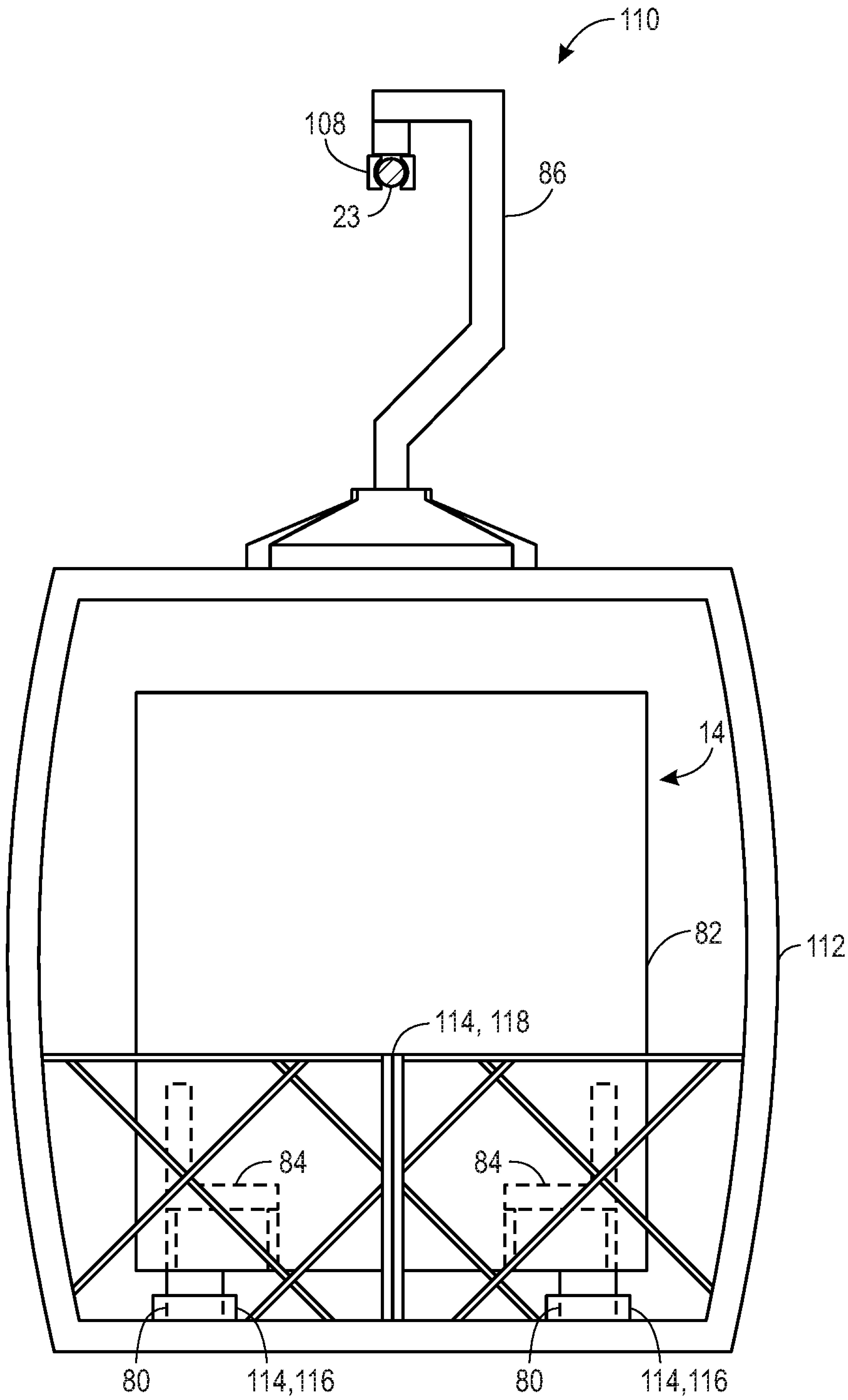

FIG. 6

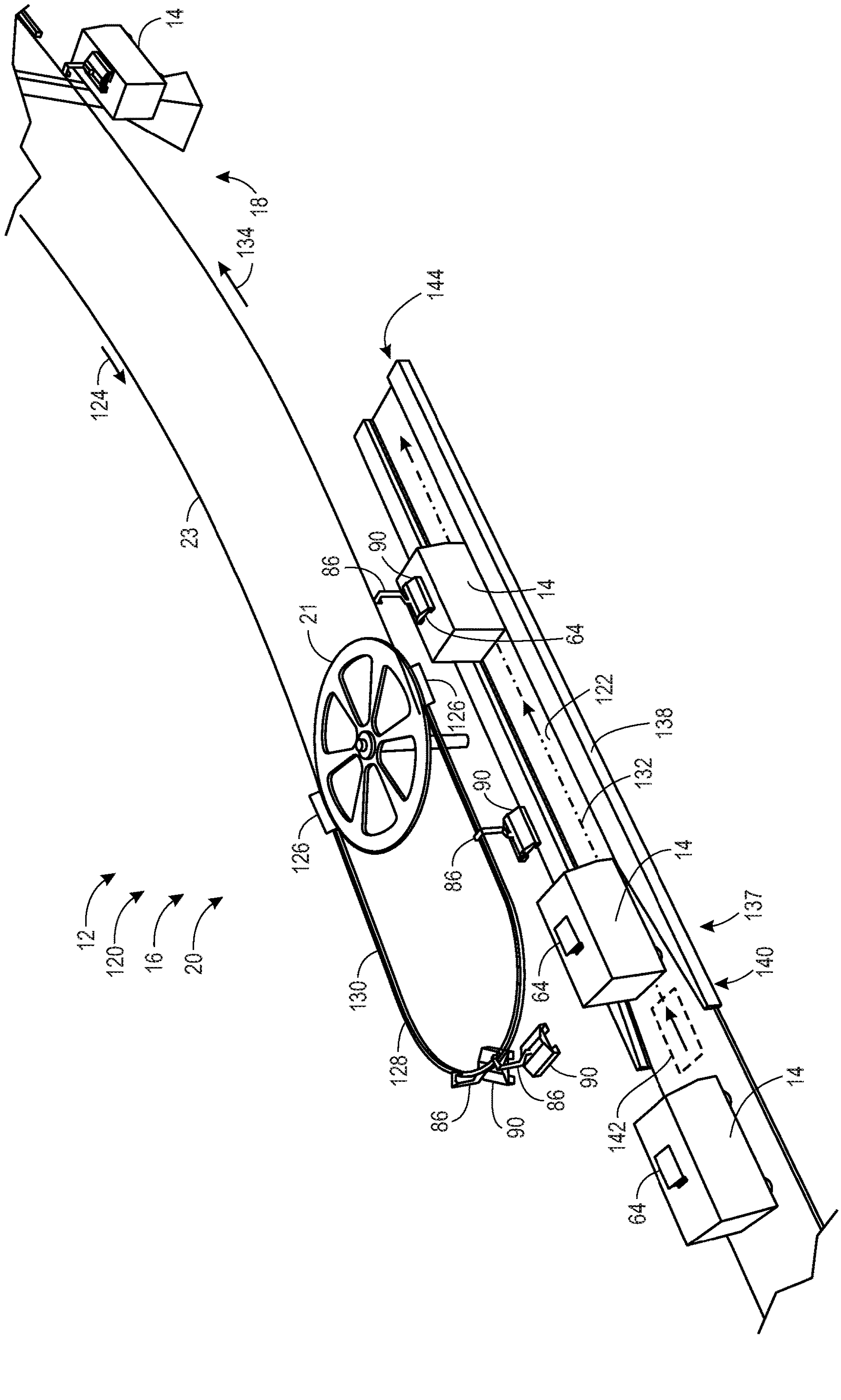
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FIG. 7

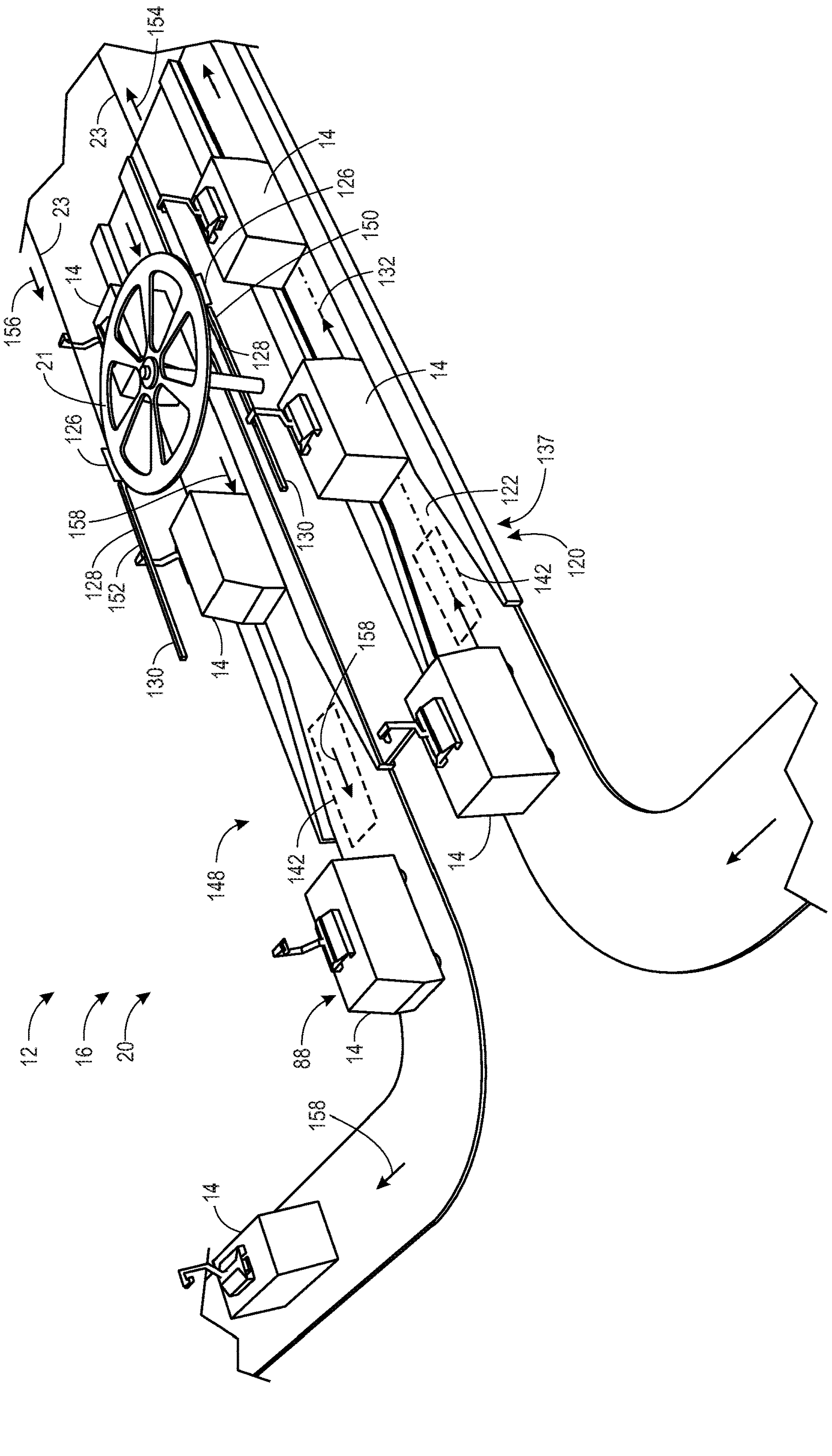
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FIG. 8

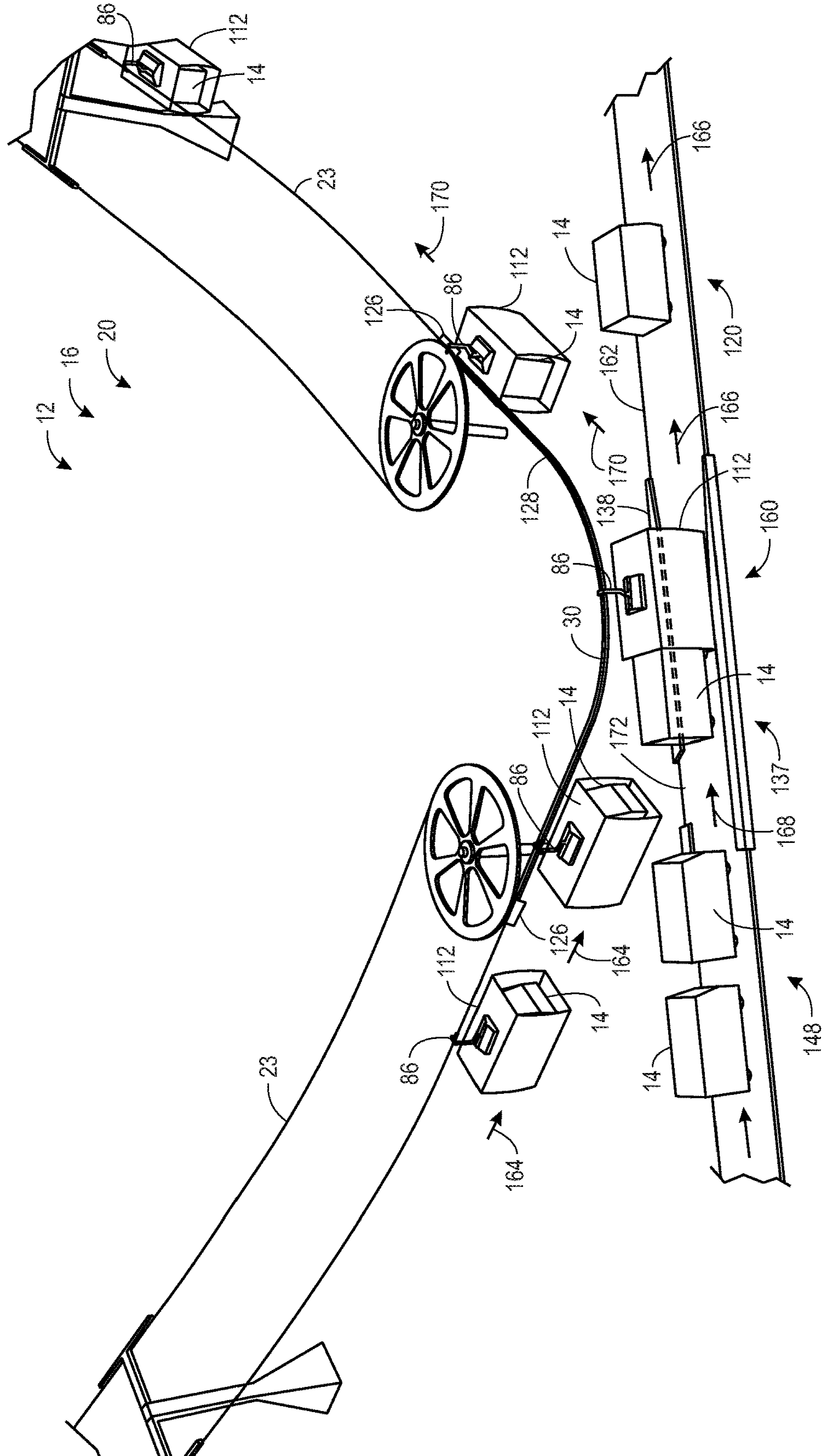

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FIG. 9

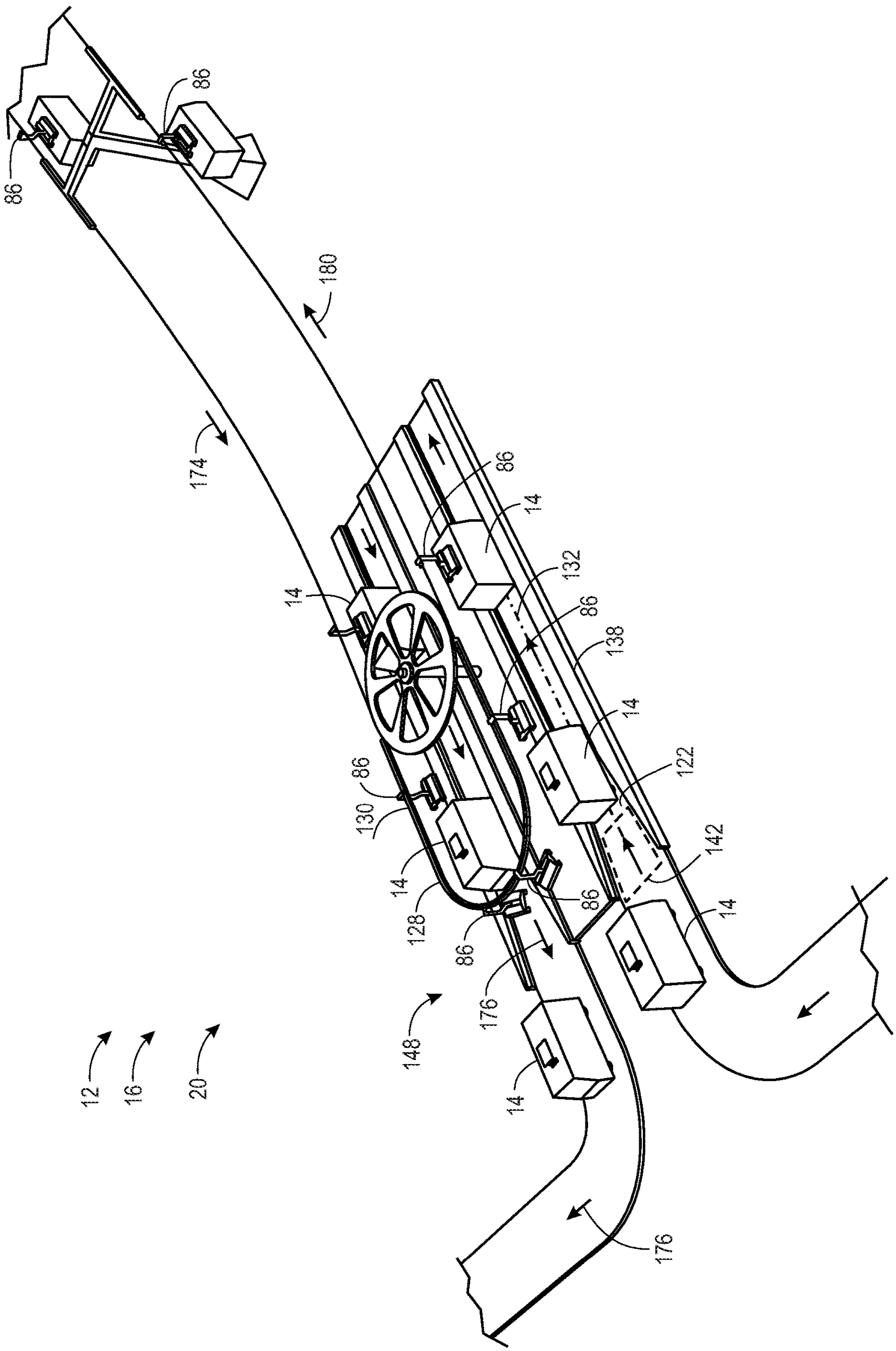
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FIG. 10

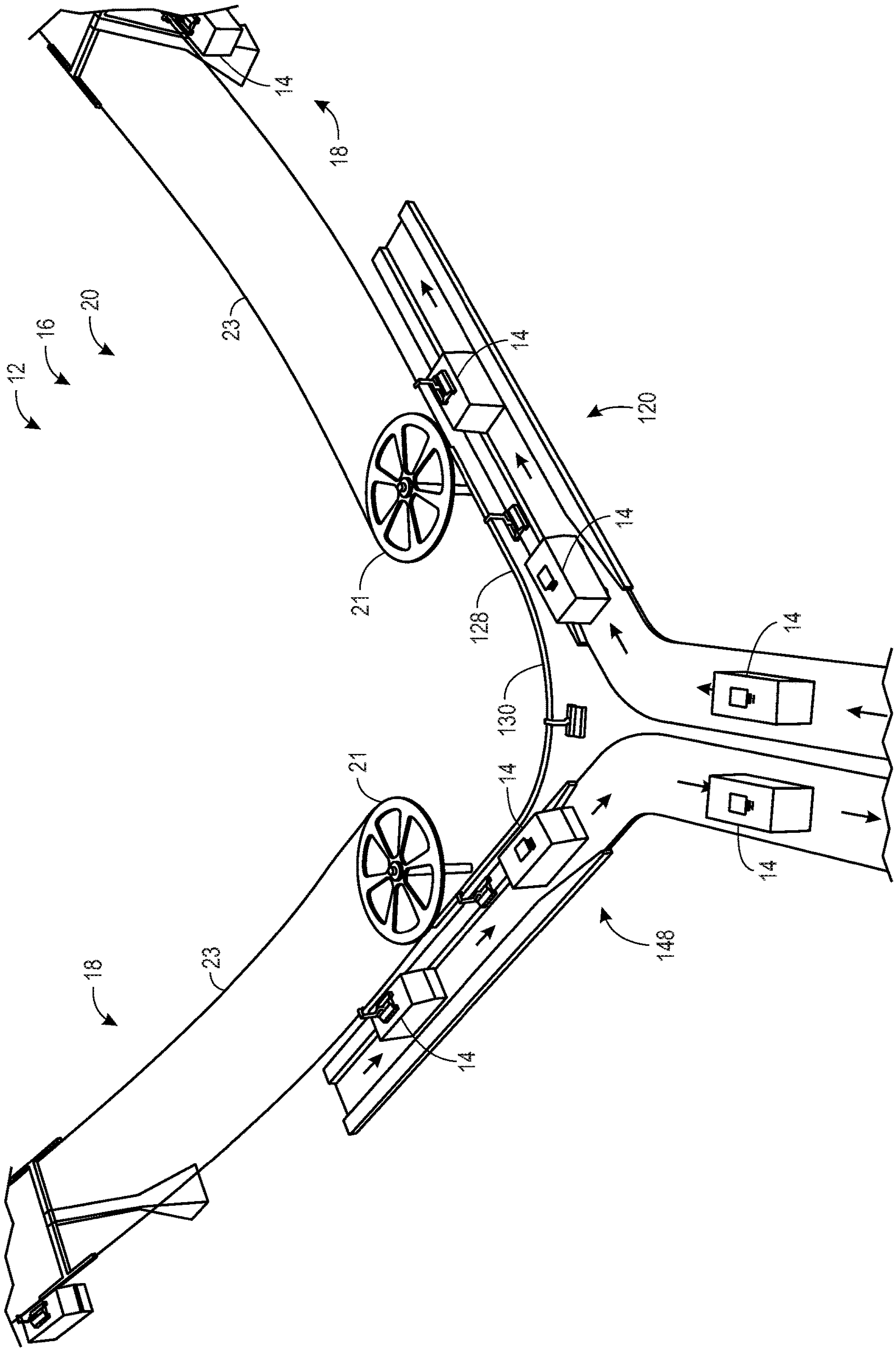
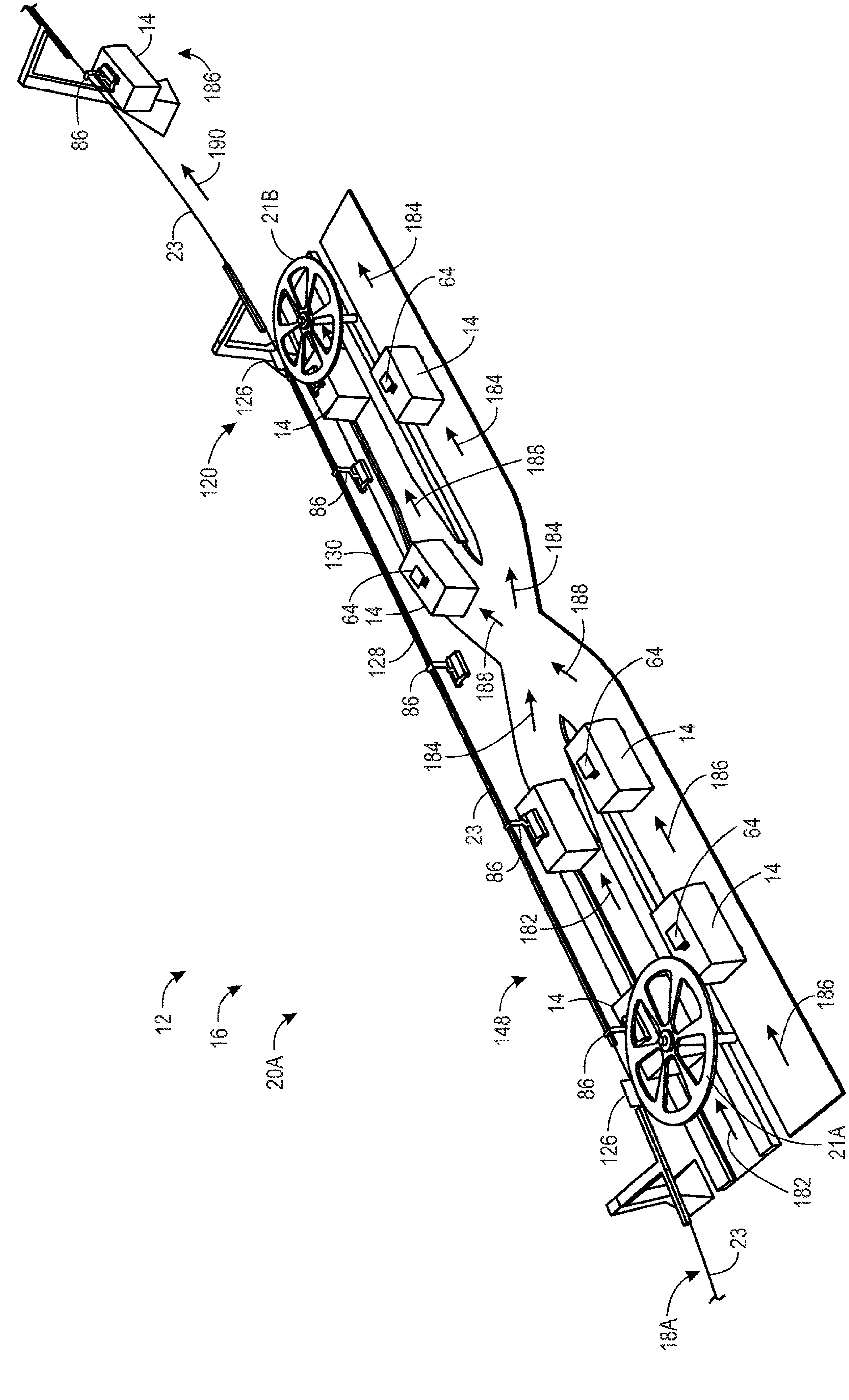


FIG. 11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18A

FIG. 12

AUTONOMOUS VEHICLE TRANSPORATION SYSTEMS AND METHODS

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to and the benefit of U.S. Provisional Application No. 62/742,093, entitled "AUTONOMOUS VEHICLE TRANSPORTATION SYSTEMS AND METHODS," filed Oct. 5, 2018, which is hereby incorporated by reference in its entirety for all purposes.

BACKGROUND

Amusement parks or similar entertainment facilities may move people and goods in a variety of ways within a park environment. However, vehicle transportation within a park is relatively complex. For example, pedestrian paths are often closed to motor vehicles. Moreover, park environments may include one or more portions (e.g., park locations, residence locations), which may be separated by roadways or geographic features. Accordingly, travel throughout the amusement park may be difficult/inconvenient.

This section is intended to introduce the reader to various aspects of art that may be related to various aspects of the present techniques, which are described and/or claimed below. This discussion is believed to be helpful in providing the reader with background information to facilitate a better understanding of the various aspects of the present disclosure. Accordingly, it should be understood that these statements are to be read in this light, and not as admissions of prior art.

SUMMARY

Certain embodiments commensurate in scope with the originally claimed subject matter are summarized below. These embodiments are not intended to limit the scope of the disclosure, but rather these embodiments are intended only to provide a brief summary of certain disclosed embodiments. Indeed, the present disclosure may encompass a variety of forms that may be similar to or different from the embodiments set forth below.

In accordance with an embodiment, an amusement park system includes multiple separated park areas, an autonomous vehicle configured to drive along ground surfaces within the multiple separated park areas, and a gondola system configured to transport the autonomous vehicle between the multiple separated park areas. The amusement park system further includes a control system configured to operate the autonomous vehicle to engage with and disengage from the gondola system to facilitate transport of the autonomous vehicle by the gondola system.

In accordance with another embodiment, an autonomous vehicle transportation system includes a gondola system, a vehicle configured to at least partially autonomously drive along a surface and comprising a gondola attachment integrally coupled to a top portion of the vehicle. The gondola attachment is configured to support a weight of the vehicle. The gondola attachment includes a locking tool configured to engage with and disengage from the gondola system. The autonomous vehicle transportation system further includes a controller configured to maneuver the vehicle into an engagement position relative to the gondola.

In accordance with a further embodiment, a vehicle transportation system includes multiple vehicles and a gondola station having an arrival zone and a departure zone. A first vehicle of the multiple vehicles is configured to aerially arrive at the arrival zone via a cable of the gondola station, disengage from the cable, and drive along a first path to exit the gondola station. A second vehicle of the multiple vehicles is configured to drive along a second path to enter the gondola station, engage to the cable, and depart from the departure zone via the cable.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of the present disclosure will become better understood when the following detailed description is read with reference to the accompanying drawings in which like characters represent like parts throughout the drawings, wherein:

FIG. **1** is a schematic diagram of an amusement park including autonomous vehicles and a gondola-enabled transportation system, in accordance with aspects of the disclosure;

FIG. **2** is a block diagram of components of an autonomous vehicle transportation system, in accordance with aspects of the present disclosure;

FIG. **3** is a schematic diagram of an embodiment of an autonomous vehicle of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure;

FIG. **4** is a schematic diagram of an embodiment of an autonomous vehicle of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure;

FIG. **5** is a schematic diagram of an embodiment of an autonomous vehicle of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure;

FIG. **6** is a schematic diagram of an embodiment of an autonomous vehicle of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure;

FIG. **7** is a perspective view of an embodiment of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure;

FIG. **8** is a perspective view of an embodiment of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure;

FIG. **9** is a perspective view of an embodiment of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure;

FIG. **10** is a perspective view of an embodiment of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure;

FIG. **11** is a perspective view of an embodiment of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure; and

FIG. **12** is a perspective view of an embodiment of the autonomous vehicle transportation system of FIG. **2**, in accordance with aspects of the present disclosure.

DETAILED DESCRIPTION

One or more specific embodiments of the present disclosure will be described below. In an effort to provide a concise description of these embodiments, all features of an actual implementation may not be described in the specification. It should be appreciated that in the development of any such actual implementation, as in any engineering or design project, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with system-related and business-related constraints, which may vary from one implementation to another. Moreover, it should be appreciated that such a development effort might be complex and time consuming, but would nevertheless be a routine undertaking of design, fabrication, and manufacture for those of ordinary skill having the benefit of this disclosure. Further, to the extent that certain terms such as parallel, perpendicular, and so forth are used herein, it should be understood that these terms allow for certain deviations from a strict mathematical definition, for example to allow for deviations associated with manufacturing imperfections and associated tolerances.

Provided herein is an autonomous vehicle transportation system that includes autonomous vehicles and a gondola system. The autonomous vehicles are configured to autonomously (e.g., without continuous user input) transport users and goods within an amusement park area. However, in some embodiments, amusement park areas may be separated by one or more obstacles, such as geographic features and/or various infrastructure, such as public road ways. Indeed, it may be desirable to travel to the separate amusement park areas with the autonomous vehicles while avoiding the obstacles. Accordingly, the autonomous vehicle transportation system may utilize the gondola system to carry the autonomous vehicles to the separate amusement park areas (or within the amusement park areas) while avoiding the obstacles.

In some embodiments, the autonomous vehicle (e.g., "the vehicle") may include a gondola attachment integrally coupled to a top of the vehicle. The gondola attachment is configured to facilitate engagement between the vehicle and the gondola system. For example, in one embodiment, the gondola attachment integrally coupled to the vehicle may be configured to engage with a gondola arm via a locking device disposed at an end of the gondola arm. That is, the vehicle is configured to drive to a gondola station, engage with a gondola arm of the gondola station via the gondola attachment, and be carried along a gondola path (e.g., a cable path) via the gondola arm. In another embodiment, the gondola attachment integrally coupled to the vehicle may include the gondola arm. That is, the vehicle is configured to drive within an amusement park area with the gondola arm integrally coupled to a top of the vehicle. The vehicle is further configured to drive to a gondola station, couple to a cable of the gondola station via a grip disposed on an end of the gondola arm, and be carried along the gondola path (e.g., the cable path) via the cable. In yet another embodiment, the gondola system may include a vehicle compartment coupled to an end of the gondola arm. In such embodiments, the vehicle is configured to drive to a gondola station, drive into the vehicle compartment, engage with the vehicle compartment, and be carried along the gondola path (e.g., the cable path) via the gondola compartment.

The gondola stations may further include a variety of embodiments configured to facilitate engagement and disengagement between the vehicle and the gondola system. For example, the gondola stations may include arrival zones, where the vehicles may arrive from a gondola path and disengage from the gondola system. The gondola stations may further include departure zones, where the vehicles may engage with the gondola system and depart along a gondola path via the cable. For example, when preparing to engage with the gondola system, the vehicle may be guided by a loading path to a center line of the loading path. The loading path may include guide rails configured to contact sides of the vehicle to guide the vehicle to the center line. The loading path may further include a sub-surface positioning system configured to guide the vehicle to the center line.

To that end, the features of an autonomous vehicle transportation system as provided herein may be used in conjunction with the disclosed embodiments. FIG. **1** is a schematic view of an amusement park **10** (e.g., amusement park system) that utilizes an autonomous vehicle transportation system **12** to transport goods and/or users (e.g., passengers) throughout the amusement park **10**. Particularly, the autonomous vehicle transportation system **12** may include vehicles **14** (e.g., autonomous vehicles, vehicles, transport units, personal rapid transit (PRT) vehicles, gondola vehicles) configured to transport guests and/or equipment/goods throughout the amusement park **10**. The vehicles **14** may be autonomous or semi-autonomous vehicles configured to travel to various locations throughout the amusement park **10** to pick up/deliver guests and/or goods. To travel throughout the amusement park **10**, the vehicles **14** may utilize a gondola system **16** of the autonomous vehicle transportation system **12**. The gondola system **16** is configured to carry the vehicles **14** in an aerial manner along gondola paths **18** (e.g., ropeways, cable paths) between gondola stations **20**, which may include bull wheels **21** configured to motivate a cable **23** along the gondola path **18**. In this way, the gondola system **16** may transport the vehicles **14** to/from the gondola stations **20** while avoiding various infrastructure (e.g., walking paths, public roadways, buildings, attractions) or geographic obstacles.

Generally, the vehicles **14** are configured to travel along the ground within park boundaries **22**. The park boundaries **22** may define one or more park areas **24** that include locations of interest, such as guest housing **26**, attractions **28**, shops **30**, parking lots **32**, and so forth. The vehicles **14** are configured to travel of their own accord (e.g., autonomously via an on-board controller) within the park boundaries **22** of the park areas **24**. For example, in some embodiments, the vehicles **14** may be configure to travel along predetermined vehicle paths **34** within the park areas **24** to transport guests/goods to different portions of the park areas **24**. However, it may be difficult to travel between the park areas **24** of the amusement park **10**. Indeed, in some embodiments, the park areas **24** may be separated by obstacles **36** such as public highways or roadways, land forms, bodies of water, and other elements that may hinder surface traveling. For example, as used herein, land forms may refer to an area of land absent of infrastructure designed for vehicular and/or pedestrian travel. Accordingly, provided herein is the gondola system **16**, which is configured to carry the vehicles **14** between the park areas **24** so as to avoid the obstacles. Further, it should be understood that, while shown and discussed substantially in reference to the amusement park **10**, the autonomous transportation system **12** may be applied to any suitable environment, such as resorts, cities, or other environments.

The autonomous vehicle transportation system **12**, defined by the vehicles **14** and the gondola system **16**, may be communicatively coupled to a controller **40**, which may represent a single master control system or multiple distributed control systems. The controller **40** may provide instructions to the vehicles **14** and/or the gondola system **16** to transport the vehicles **14** between and/or within the park areas **24**, as discussed herein.

FIG. **2** is a block diagram of certain components of the autonomous vehicle transportation system **12**. It should be understood that the illustrated components may have additional software or hardware elements. Further, the functionality of various disclosed hardware or software elements may be duplicated and/or exchanged in the illustrated components.

The autonomous vehicle transportation system **12** may be configured to operate at least in part via instructions from the controller **40**, which may include a memory **42** for storing instructions executable by a processor **44** to perform the methods and control actions described herein. The processor **44** may include one or more processing devices, and the memory **42** may include one or more tangible, non-transitory, machine-readable media. By way of example, such machine-readable media can include RAM, ROM, EPROM, EEPROM, CD-ROM, or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to carry or store desired program code in the form of machine-executable instructions or data structures and which can be accessed by the processor **44** or by a special purpose or programmed computer or other machine with a processor.

In addition, the controller **40** may be configured to include communication circuitry **46** (e.g., a transceiver or other communications devices) to communicate over wired and wireless communication paths with one or more other components of the autonomous vehicle transportation system **12**.

As discussed, the autonomous vehicle transportation system **12** may include one or more autonomous vehicles **14** that includes a motor **48** and a power source **50** (e.g., a battery, a solar panel, an electrical generator, a gas engine, or any combination thereof). The operations of the motor **48** may be controlled by a vehicle controller **52** including a memory **54** and a processor **56** and configured to operate any on-board logic to control vehicle paths or progress. For example, the vehicle **14** may respond to local environmental input via one or more on-board sensors **58**. The vehicle controller **52** may control the motor **48** to adjust its output power to accelerate or decelerate the vehicle **14**. The vehicle controller **52** may also control a brake to decelerate or stop the vehicle **14**. Further, the vehicle controller **52** may operate under instructions from the rider (e.g., guest, passenger) via a user input interface, or user input **60** (e.g., system or device for receiving input), or from the controller **40**, via communication circuitry **46**. For example, the user may utilize the user input **60** to input a desired destination. The vehicle controller **52** and/or the controller **40** may communicate to the user via a display **62**. For example, the display **62**, which may be a portion of the user input **60**, may show the user a future destination, a time remaining until the destination is reached, or optional stops along the way to the destination. To illustrate, in some embodiments, a user may input a desired destination to the vehicle controller **52** and/or the controller **40**. As the autonomous vehicle **14** travels to the destination, the vehicle **14** may utilize the gondola paths **18** of the gondola system **16**. While traveling along the gondola paths **18**, the vehicle **14** may travel through one or more of the gondola stations **20**. Accordingly, at each juncture of the gondola paths **18**, such as at the gondola stations **20**, the user may have the option to adjust the current travel route of the vehicle **14**, such as by disengaging from the gondola system **16** and traveling by ground to a different destination, as opposed to continuing along the gondola path **18**. Generally, the controller **40** may receive a first signal indicative of a first location of the vehicle **14**, receive a second signal indicative of a second location from the display **62** (e.g., user interface) of the vehicle **14**, and provide a third signal to the vehicle controller **52** of the vehicle **14** to cause the vehicle **14** to travel from the first location to the second location.

The autonomous vehicle **14** may store image and/or navigation files of the amusement park **10** in the memory **54** such that navigation may be executed using the processor **56** of the vehicle controller **52** to execute on-board logic. The sensors **58** may include one or more cameras, laser scanners, and/or ultrasonic scanners that provide inputs to the vehicle controller **52** to execute turns or navigation instructions to avoid obstacles. In some embodiments, the sensors **58** may include a global positioning system (GPS) configured to detect a position of the vehicle **14**. The sensors **58** may communicate the position of the vehicle **14** to the vehicle controller **52** and/or the controller **40** for navigation purposes.

The autonomous vehicle **14** may further include a gondola attachment **64** (e.g., a locking device) integrally coupled to the vehicle **14** and configured to engage, or couple, the autonomous vehicle **14** with the gondola system **16**. That is, as discussed in further detail below, the autonomous vehicle **14** is configured to drive to a gondola station **20** of the gondola system **16**, engage with the gondola system **16** via the gondola attachment **64**, and be transported to a corresponding gondola station **20** via the gondola path **18**. Accordingly, the gondola system **16** may include a corresponding locking device **66** configured to engage with the gondola attachment **64** of the vehicle **14**. In some embodiments, the gondola system **16** may further include sensors **58** configured to detect the engagement of the vehicle **14** and the gondola system **16**. The sensors **58** may include, for example, pressure sensors configured to detect a weight (e.g., a presence) of the vehicle **14** on the gondola system **16**. The sensors **58** may further include proximity sensors configured to detect engagement of the gondola attachment **64** of the vehicle **14** with the locking device **66** of the gondola system **16**.

The gondola system **16** may communicate with the controller **40** via the communication circuitry **46**, which may include a bus bar, for example. In one embodiment, the sensors **58** may send data indicative of engagement of the vehicle **14** with the gondola system **16** to the controller **40** via the communication circuitry **46**. The gondola system **16** may further include a power source **70** configured to provide power to the locking device **66**, the sensors **58**, and the communication circuitry **46**. The power source **70** may include, for example, a battery, a solar panel, an electrical generator, a gas engine, an electrical power grid, or any combination thereof. In some embodiments, the power source **70** of the gondola system **16** may be configured to provide power to the power source **50** of the vehicle **14** via charging a battery, or as a substitute power source, for example.

FIG. **3** is a schematic view of an embodiment of the autonomous vehicle **14**. The vehicle **14** includes wheels **80** configured to drive the vehicle **14** throughout the amusement park **10**, a frame **82** configured to provide structural support for the vehicle **14**, one or more seats **84** configured to provide seating for users/guests, and the gondola attachment **64** configured to couple with the gondola system **16**.

Generally, to maneuver the vehicle **14** through the amusement park **10**, the wheels **80** are configured to drive the vehicle **14** utilizing power from the power source **50**. The wheels **80** are also configured to steer the vehicle **14** according to input from the vehicle controller **52**. For example, the wheels **80** may cause the vehicle **14** to travel to gondola stations **20** of the gondola system **16**. At the gondola stations **20** of the gondola system **16**, the vehicle **14** is configured to couple to a gondola arm **86** of the gondola system **16** via the gondola attachment **64**. The gondola attachment **64** is integrally coupled (e.g., bolted, welded) to a top **88** (e.g., roof) of the frame **82** of the vehicle **14**. Indeed, the vehicle **14** is configured to be vertically supported (e.g., carried) via the gondola attachment **64**. In other words, the frame **82** of the vehicle **14** is structured (e.g., reinforced) to provide support in the vertical direction such that an entirety of a weight of the vehicle **14**, and any cargo (e.g., people, goods) in the vehicle **14**, may be supported from the gondola attachment **64** via the frame **82**.

The gondola attachment **64** is configured to engage with the gondola locking device **66** included in a base **90** (e.g., a first end) of the gondola arm **86**. As discussed herein, engagement between the vehicle **14** (e.g., via the gondola attachment **64**) and the gondola system **16** (e.g., via the locking device **66**) may refer to one or more components (e.g., one or more locking tool **91**) of the gondola attachment **64** actuating to couple to one or more components of the gondola locking device **66**, or vice versa. For example, engagement may refer to the locking device **66** (e.g., the locking tool **91**) clamping on to the gondola attachment **64**, or the gondola attachment **64** (e.g., the locking tool **91**) extending protrusions (e.g., pins) into receptacles of the locking device **66**. In some embodiments, engagement may refer to one or more components of the gondola attachment **64** (e.g., the locking tool **91**) and/or the gondola locking device **66** rotating to engage the vehicle **14** and the gondola system **16**.

In some embodiments, engagement between the gondola attachment **64** and the gondola locking device **66** may be caused in part by input from the wheels **80**. For example, the wheels **80** may be communicatively coupled (e.g., electrically and/or mechanically) to the gondola attachment **64**. To this end, the gondola attachment **64** (e.g., the locking tool **91**) may be configured to engage with the gondola locking device **66** if a weight (e.g., a force) experienced by the wheels **80** is below a predetermined threshold. Specifically, the weight being below the predetermined threshold may indicate that the vehicle **14** is being supported by the gondola system **16**, as opposed to by the wheels **80**. In some embodiments, the sensor **58** may include a pressure sensor that is configured to detect a weight on the wheels **80**. The sensor **58** may send data indicative of the weight on the wheels **80** to the vehicle controller **52**, which may cause the gondola attachment **64** to engage with the gondola locking device **66** if the weight is below the predetermined threshold. Further, in one embodiment, the wheels **80** are configured to transition between a first, retracted, position and a second, extended position. The wheels **80** may be in the first position when the weight of the vehicle **14** is being supported via the wheels **80** and may be in the second position when the weight of the vehicle **14** is being supported through a different point, such as via the gondola attachment **64**. Accordingly, a transition from the first, retracted position, to the second, extended position, may cause the vehicle **14** to engage with locking device **66**. It should be noted that other sensors may also be used to ascertain an engagement. For example, pressure sensors located at an engagement point may be utilized.

FIG. **4** is schematic view of the vehicle **14** engaged with the gondola arm **86**. As discussed above in reference to FIG. **3**, the vehicle **14** includes the wheels **80** configured to drive the vehicle **14** throughout the amusement park **10**, the frame **82** configured to provide structural support for the vehicle **14**, the one or more seats **84** configured to provide seating for users/guests, and the integral gondola attachment **64** configured to couple with the gondola system **16**. Further, as shown, in some embodiments, the gondola attachment **64** (e.g., the locking tool **91**) may include a convex surface **92** configured to interact with a concave surface **94** of the locking device **66** of the gondola arm **86** to facilitate engagement between the vehicle **14** and the gondola arm **86**. For example, the corresponding convex and concave surfaces **92**, **94** of the gondola attachment **64** and the locking device **66** of the gondola arm **86**, respectively, serve to guide the gondola attachment **64** into the gondola locking device **66** of the gondola arm **86**. In this manner, when the gondola attachment **64** is inserted into the gondola locking device **66**, the gondola attachment **64** may be centered onto the gondola locking device **66**, such as by sliding along the concave surface **94** of the gondola locking device **66**.

Further in some embodiments, when the gondola attachment **64** is disposed within the gondola locking device **66**, the gondola attachment **64** may apply a downward force to the gondola locking device **66**, as indicated by arrow **96**. In some embodiments, the downward force may be caused by the gondola arm **86** moving upward, away from the vehicle **14** (e.g., due to the movement of the gondola arm **86** with the cable **23**). When the gondola attachment **64** applies the downward force to the gondola locking device **66**, pressure mechanisms **98** (e.g., pressure switches, sensors) disposed below the locking device **66** may experience the downward force and cause one or more components of the locking device **66** to actuate to secure (e.g., engage) the gondola attachment **64** in the locking device **66**. For example, when the pressure mechanisms **98** sense the downward force, one or more latches **100** may be actuated to hold the gondola attachment **64** within the locking device **66**. Particularly, the one or more latches **100** may be mechanically activated, such as by a result of the downward force applied to the pressure mechanisms **98**, or electrically activated, such as by a result of signals sent from the controller **40** based on the downward force experienced by the pressure mechanism **98**. Moreover, in some embodiments, the gondola attachment **64** may be configured to passively engage with the locking device **66** of the gondola arm **86**. For example, the gondola attachment **64** and/or the locking device **66** may include one or more pawls **102**. The one or more pawls **102** each include a pivoted bar configured to allow movement in one direction, and block movement in another direction. For example, the one or more pawls **102** may allow the movement of insertion of the gondola attachment **64** into the locking device **66** and block the movement of extraction of the gondola attachment from the locking device **66**. Indeed, during decoupling, or disengagement, of the gondola attachment **64** and the locking device **66**, the pawls **102** may be retracted, such as by an actuator **104**, to allow the movement of extraction of the gondola attachment **64** from the locking device **66**.

FIG. **5** is a schematic view of an embodiment of the autonomous vehicle **14**. Similar to embodiments discussed above, the vehicle **14** includes the wheels **80** configured to drive the vehicle **14** throughout the amusement park **10**, the frame **82** configured to provide structural support for the vehicle **14**, the one or more seats **84** configured to provide seating for users/guests, and the integral gondola attachment **64** configured to couple with the gondola system **16**. In the current embodiments, the integral gondola attachment **64** is configured to couple directly to the cable **23**, or rope, of the gondola system **16**. Particularly, the gondola attachment **64**, which is integrally coupled to the frame **82** of the vehicle **14**, may include the gondola arm **86**. In other words, the vehicle **14** is configured to drive throughout the amusement park **10** with the gondola arm **86** integrally attached to the top **88** (e.g., roof) of the vehicle **14**. When the vehicle **14** travels to a gondola station **20** of the gondola system **16**, the vehicle **14** is configured to couple to the gondola system **16** via a grip **108** (e.g., (e.g., the locking tool **91**, a detachable grip, a coupling mechanism, a clamp, etc.) disposed at a second end **110** of the gondola arm **86**. In certain embodiments, the grip **108** may be activated to couple to and decouple from the cable **23** through interaction with one or more structures of the gondola stations **20**, as discussed in further detail below.

FIG. **6** is a schematic view of an embodiment of the autonomous vehicle **14** coupled to the gondola system **16** via a vehicle compartment **112** extending from the gondola arm **86**. Similar to embodiments discussed above, the vehicle **14** may include the wheels **80** configured to drive the vehicle **14** throughout the amusement park **10**, the frame **82** configured to provide structural support for the vehicle **14**, and the one or more seats **84** configured to provide seating for users/guests. The vehicle compartment **112** includes one or more security devices **114** to secure the vehicle **14** to the vehicle compartment **112**. Because the vehicle **14** is configured to be coupled to the gondola system **16** via the vehicle compartment **112**, the frame **82** of the vehicle **14** in the illustrated embodiment may not necessarily provide support for the vehicle **14** in the vertical direction, as discussed above. Indeed, in the current embodiment, the vehicle **14** may be lesser in weight as compared to other embodiments discussed herein, which may include the integral gondola attachment **64** and the frame **82** configured to support the vehicle **14** from the vertical direction. The reduced weight of the vehicle **14** in the current embodiment may be advantageous for more efficient power/fuel consumption during use of the vehicle **14**.

In some embodiments, the security devices **114** may include wheel locks **116** configured to engage with the wheels **80** of the vehicle **14**. Accordingly, when the vehicle **14** drives into the vehicle compartment **112**, the wheel locks **116** are configured to engage with the wheels **80** to couple the vehicle **14** to the vehicle compartment **112**. Further, in some embodiments, the security devices **114** may include a barrier **118** (e.g., a gate) configured to secure the vehicle **14** within the vehicle compartment **112**. In some embodiments, the barrier **118** may be configured to actuate between an open and a closed position. While the barrier **118** is in the open position, the vehicle **14** may be permitted to enter and leave the vehicle compartment **112**. In some embodiments, while in the open position, the barrier **118** may serve as a ramp to facilitate entrance or departure of the vehicle **14** to/from the vehicle compartment **112**. While the barrier **118** is in the closed position, if the vehicle **14** is disposed within the vehicle compartment **112**, the barrier **118** may prevent, or block, the vehicle **14** from leaving the vehicle compartment **112**. Particularly, in some embodiments, while the barrier **118** is in the closed position, the barrier **118** may contact the vehicle **14** to hold the vehicle **14** in a stable and stationary position within the vehicle compartment **112**. In some embodiments, the security devices **114** may operate based on one or more signals from the vehicle controller **52** and/or the controller **40**. That is, the controller(s) **40**, **52** may send signals to the security devices **114** to cause the security devices **114** to actuate to lock the vehicle **14** within the vehicle compartment, as discussed above, or may actuate to release (e.g., decouple) the vehicle **14** from the vehicle compartment **112**. In some embodiments, the security devices **114** may be mechanically actuated, such as by a weight of the vehicle **14** within the vehicle compartment **112**. Further, it is to be understood that the vehicle compartment **112** is also configured to accept objects/devices/systems other than the vehicle **14**. For example, the vehicle compartment **112** is configured to contain/transport autonomous cars, regular cars, bikes, and/or people.

It should be noted that all of the various embodiments (e.g., the embodiments shown in FIGS. **3**-**6** of the vehicle **14**) may be combined with any of the various loading/unloading station arrangements set forth herein. Indeed, various combinations of attachment mechanisms, vehicle configurations, and loading station arrangements may be employed in any of numerous combinations based on the presently disclosed embodiments. The illustrated embodiments are representative and the present disclosure is not limited to merely illustrated embodiments.

FIG. **7** is a perspective view of the autonomous vehicle transportation system **12**, which includes the vehicles **14** and the gondola system **16**. Specifically, FIG. **7** includes a view of a departure zone **120** of a gondola station **20**. That is, the vehicles **14** may arrive to the departure zone **120** via a loading path **122** (e.g., loading track), couple to the cable **23** of the gondola system **16** via the gondola arm **86**, and depart along the gondola path **18** to a corresponding gondola station **20**.

In the current embodiment, the gondola system **16** includes the gondola arm **86** with the gondola locking device **66** coupled to the base **90** of the gondola arm **86**, as discussed above in reference to FIGS. **3** and **4**. As the gondola arm **86** arrives to the gondola station **20**, as indicated by arrow **124**, the gondola arm **86** may be coupled to the cable **23** via the grip **108** (shown in FIG. **3**). When the gondola arm **86** reaches the bull wheel **21**, the grip **108** may interact with an attachment manager **126** coupled to an arm carrier **128** (e.g., holding track) of the gondola system **16**. Particularly, the arm carrier **128** is configured to transfer gondola arms **86** and/or vehicle compartments **112** between locations (e.g., engagement/disengagement locations) within the gondola station **20** and to store gondola arms **86** and/or vehicle compartments **112** subsequent to disengagement and prior to engagement to vehicles **14**. The attachment manager **126** may disengage the grip **108** from the cable **23**, and position the gondola arm **86** on the arm carrier **128**. The arm carrier **128** may include one or more drive elements **130** (e.g. individually powered wheels) configured to move each gondola arm **86** along the arm carrier **128**. Particularly, the drive elements **130** may move the gondola arm **86** to a center line **132** of the loading path **122** to couple to a vehicle **14**. For example, when the gondola arm **86** is positioned on the center line **132** the loading path **122**, the locking device **66** of the gondola arm **86** may couple to the gondola attachment **64** of a vehicle **14**. Indeed, while the vehicle **14** is positioned on the center line **132**, the vehicle **14** may be considered in an engagement position to engage with the gondola system **16**. Once the gondola arm **86** is coupled to the gondola attachment **64**, the drive elements **130** may drive the gondola arm **86** and the vehicle **14** toward a second attachment manager **126**. When the grip **108** of the gondola arm **86** interacts with the attachment manager **126**, the attachment manager **126** may position the grip **108** onto the cable **23** and cause the grip **108** to couple to the cable **23**. Once the grip **108** of the gondola arm **86** is coupled to the cable **23**, the cable **23** may carry the gondola arm **86** and the vehicle **14** to the corresponding gondola station **20**, as indicated by arrow **134**. Indeed, the arm carrier **128** is configured to store a plurality of gondola arms **86** as the gondola arms **86** arrive to the gondola station **20**. In some embodiments, the controller **40** may monitor the location of the vehicles **14** and may send one or more signals to the drive elements **130** to cause the gondola arms **86** to be moved to the center line **132** as the vehicles **14** approach the loading path **122**. Further, in certain embodiments, if the arm carrier **128** is at capacity for storing gondola arms **86**, the controller **40** may cause the drive elements **130** to move the gondola arms **86** along the arm carrier **128** to couple to the cable **23** to make room for more arriving gondola arms **86**. Indeed, once coupled to the cable **23**, the gondola arm **86** will be passed to the corresponding gondola station **20**.

The loading path **122** (e.g., loading track) may include a guidance system **137** utilized to facilitate loading, or engagement, of the vehicle **14** onto the cable **23** of the gondola system **16** for aerial travel across the amusement park **10**. For example, the guidance system **137** may include guide rails **138** that are configured to contact sides of the vehicle **14** to guide the vehicle **14** to the center line **132** along the loading path **122** to facilitate engagement between the vehicle **14** and the gondola arm **86**. In some embodiments, the guide rails **138** may include a flared entrance **140**. Indeed, the guide rails **138** may serve as a funnel configured to guide the vehicle **14** to the center line **132** on the loading path **122**. Further, in some embodiments, the guidance system **137** may have one or more sub-surface positioning systems **142** configured to position the vehicle **14** onto the center line **132**. That is, the sub-surface positioning system **142** may include one or more elements configured to interact with the wheels **80** (or an underside) of the vehicle **14** to position the vehicle **14** on the center line **132**. For example, in some embodiments, the sub-surface positioning system **142** of the loading path **122** may include the grid elements of the dynamic driving area of U.S. Pub. No. 2016/0070262, which is hereby incorporated by reference, in its entirety. Further, in some embodiments, the sub-surface positioning system **142** of the loading path **122** may include the propulsion system of U.S. Pub. No. 2018/0056792, which is hereby incorporated by reference, in its entirety.

Moreover, in some embodiments the cable **23** is configured to lift the vehicle **14** from the loading path **122** prior to the vehicle **14** reaching an end **144** of the loading path **122** to ensure engagement of the locking device **66** of the gondola arm **86** with the gondola attachment **64** of the vehicle **14**. Indeed, as discussed above, in some embodiments, the locking device **66** and the gondola attachment **64** may be engaged when the vehicle **14** is lifted such that the wheels **80** are not supporting the weight of the vehicle **14** or based on various sensor inputs. Accordingly, by lifting the vehicle **14** prior to the end of the loading path **122**, the gondola attachment **64** may be actuated to cause engagement between the gondola arm **86** and vehicle **14** while the vehicle **14** is disposed over the surface of the loading path **122**. In this manner, if the gondola arm **86** and the vehicle **14** are not adequately engaged when the vehicle **14** is lifted from the surface of the loading path **122**, as discussed above, the gondola system **16** may discontinue operation (e.g., in response to one or more signals from the controller **40**) such that the vehicle **14** is held stationary over the loading path **122** via the cable **23**. One or more maintenance operations may then be carried out on the vehicle **14**, such as by system operators/technicians.

FIG. **8** is a perspective view of the autonomous vehicle transportation system **12**, which includes the vehicles **14** and the gondola system **16**. Specifically, FIG. **8** includes a gondola station **20** having a departure zone **120** and an arrival zone **148**. Similar to embodiments discussed above in reference to FIG. **7**, the gondola station **20** may include the loading path **122**, the guide rail **138**, the sub-surface positioning system **142**, the arm carrier **128**, and the bull wheel **21**. In the current embodiment, the vehicles **14** include the gondola arm **86** integrally attached to the top **88** of the vehicle **14**. Accordingly, the arm carrier **128** may include separate first and second portions **150**,**152**. Particularly, the first portion **150** of the arm carrier **128** may be associated with the departure zone **120** and the second portion **152** of the arm carrier **128** may be associated with the arrival zone **148**. For example, the vehicle **14** may drive to the loading path **122** and interact with the guidance system **137** (e.g., the guide rails **138** and/or the sub-surface positioning system **142**). That is, the guidance system **137** may place the vehicle **14** on the center line **132** of the loading path **122**. Once positioned on the center line **132**, the vehicle **14** may couple to the first portion **150** of the arm carrier **128**. The drive elements **130** of the arm carrier **128** may then drive the gondola arm **86** and the vehicle toward the cable **23**, where the attachment manager **126** is configured to cause the grip **108** to couple to the cable **23**. In some embodiments, the motor **48** of the vehicle **14** may drive the vehicle **14** along the arm carrier **128** (e.g., via the wheels **80**) toward the cable **23**, where the attachment manager **126** is configured to cause the grip **108** to couple to the cable **23**. Once coupled to the cable **23**, the cable **23** may carry the vehicle **14** to a corresponding gondola station **20**, as indicated by arrow **154**.

When the vehicles **14** arrive to the gondola station **20** via the cable **23**, as indicated by arrow **156**, the grip **108** of the gondola arm **86** may interact with the attachment manager **126** of the second portion **152** of the arm carrier **128**. Particularly, the attachment manager **126** may cause the grip **108** of the gondola arm **86** to detach from the cable **23**, and position the grip **108** along the second portion **152** of the arm carrier **128**. Once on the second portion **152** of the arm carrier **128**, the drive elements **130** of the arm carrier **128** may motivate the vehicles **14** forward, out of the gondola station **20**, as indicated by arrows **158**. In some embodiments, the motor **48** of the vehicle **14** may drive the vehicle **14** along the arm carrier **128** (through contact with the ground), out of the gondola station **20**.

FIG. **9** is a perspective view of the autonomous vehicle transportation system **12**, which includes the vehicles **14** and the gondola system **16**. Specifically FIG. **9** includes a gondola station **20** having both an arrival zone **148** and a departure zone **120** directly coupled via a transition zone **160**. In other words, the gondola station **20** includes a single path **162** in which the vehicles **14** are configured to engage with, and disengage from, the vehicle compartment **112**. Indeed, in the current embodiment, the gondola system **16** includes the gondola arm **86** integrally coupled to the vehicle compartment **112**, as discussed above in FIG. **6**. To illustrate, the vehicles **14** (or the vehicle compartments **112** absent of vehicles **14**) are configured to arrive at the gondola station **20** via the cable **23**, as indicated by arrows **164**. At the same time, vehicles **14** may be positioned along the path **162** of the arrival zone **148**. When the vehicle compartment **112** arrives to the transition zone **160**, a grip **108** of the gondola arm **86** may interact with the attachment manager **126** to decouple the grip **108** from the cable **23**, and position the grip **108** onto the arm carrier **128**. Once on the arm carrier **128**, the drive elements **130** may position the vehicle compartment **112** within the transition zone **160** of the ride path **162**. Once positioned along the transition zone **160** of the ride path **162**, if the vehicle compartment **112** is engaged with a vehicle **14**, the vehicle compartment **112** may disengage from the vehicle **14** and the vehicle **14** may drive off from the vehicle compartment **112**, as indicated by arrows **166**. Once the vehicle **14** has driven off from the vehicle compartment **112**, a vehicle **14** from the departure zone **120** may drive into the vehicle compartment **112**, as indicated by arrow **168**, and may engage with the vehicle compartment **112**, as discussed above in reference to FIG. **6**. In other words, once the vehicle compartment **112** is stationed on the transition zone **160** without a vehicle **14** engaged to the vehicle compartment **112**, the next vehicle **14** in the arrival zone **148** may drive into, and engage with, the vehicle compartment **112**. Once the vehicle **14** from the arrival zone **148** is engaged with the vehicle compartment **112**, the drive elements **130** may move the vehicle compartment **112** to the cable **23**, where the grip **108** of the gondola arm **86** may interact with the attachment manager **126**. The attachment manager **126** may then couple the grip **108** to the cable **23**, and the cable **23** may carry the vehicle **14** to a corresponding gondola station **20**, as indicated by arrows **170**.

Further, it should be noted that the length of the arm carrier **128** may be designed based on an estimated throughput of the gondola station **20**. Indeed, the length of the arm carrier **128**, as shown, is merely an example of a possible length of the arm carrier **128**. In some embodiments, the arm carrier **128** may be longer in length to hold an increased number of gondola arms **86** (and/or vehicle compartments **112**). Indeed, in some embodiments, the gondola arms **86** may arrive to the gondola station **20** at faster rate than vehicles **14** may disengage and engage with the vehicle compartment **112** in the transition zone **160**. In such embodiments, it may be beneficial for the arm carrier **128** to store an adequate number of vehicle compartments **112**.

Moreover, in some embodiments, the path **162** may include the guidance system **137**, which may include the sub-surface positioning system **142** and/or the guide rails **138**. As shown, in the current embodiment, the guide rails **138** may include a gap **172** along the edge of the path **162** disposed adjacent to the arm carrier **128**. The gap **172** is to permit the vehicle compartment **112** to enter the path **162** through the gap **172**.

FIG. **10** is a perspective view of an embodiment of the autonomous vehicle transportation system **12**, which includes the vehicles **14** and the gondola system **16**. Embodiments illustrated in FIG. **10** may be similar to the embodiments discussed above in reference to FIG. **8**. However, as oppose to the having the first portion **150** of the arm carrier **128** and the second portion **152** of the arm carrier **128**, the arm carrier **128** may be a continuous unit that couples the arrival zone **148** to the departure zone **120**. For example, when a vehicle **14** approaches the gondola station **20** via the cable, as indicated by arrow **174**, the vehicle **14** may decouple from the gondola arm **86** and exit from the gondola station **20**, as indicated by arrows **176**. Once the vehicle **14** disengages from the gondola arm **86**, the gondola arm **86** may continue along the arm carrier **128** to the departure zone **120** in response to the drive elements **130**. Once the gondola arm **86** is in line with the center line **132** of the loading path **122** of the departure zone **120**, the gondola arm **86** may couple to a vehicle **14** from the departure zone **120**. The gondola arm **86** may then carry the vehicle **14** along the gondola path **18**, out of the gondola station **20**, as indicated by arrow **180**.

FIG. **11** is a perspective view of an embodiment of the autonomous vehicle transportation system **12**, which includes the vehicles **14** and the gondola system **16**. Embodiments illustrated in FIG. **11** may be similar to the embodiments discussed above in reference to FIG. **10**. However, the gondola station **20** may include an arrival zone **148** corresponding to a separate gondola path **18** from a departure zone **120**. For example, as shown, the gondola paths **18** may form a ninety degree angle. However, it is to be understood that there may be any suitable angle between the gondola paths **18**.

Similar to FIG. **7**, the vehicles **14** illustrated in FIG. **11** are configured to engage with the cable **23** of a gondola path **18** at a departure zone **120** of a gondola station **20**. The same gondola station **20** may further include an arrival zone **148** of a separate gondola path **18**. The arrival zone **148** may function similarly to the arrival zone **148** of FIG. **10**. Moreover, the gondola station **20** may include an arm carrier **128** that is coupled between the bull wheel **21** of the departure zone **120** and the bull wheel **21** of the arrival zone **148**. Indeed, similar to the arm carrier **128** of FIG. **10**, the arm carrier **128** is configured to move gondola arms **86** from the arrival zone **148** to the departure zone **120**, as shown, via the drive elements **130**. Indeed, in some embodiments, the arm carrier **128** may be configured to store the gondola arms **86** that come from gondola path **18** corresponding the arrival zone **148**, and transfer the gondola arms **86** to the departure zone **120** as necessitated by the arrival of vehicles **14** to the departure zone **120**.

FIG. **12** is a perspective view of the autonomous vehicle transportation system **12**, which includes the vehicles **14** and the gondola system **16**. As shown, in some embodiments, the gondola station **20***a* may be disposed along a gondola path **18**, such as in between bull wheels **21** of the gondola path **18** (as shown by the gondola station **20***a* of FIG. **1**). Indeed, the arrival zone **148** and the departure zone **120** of the gondola station **20***a* may be substantially in-line or parallel. To illustrate, vehicles **14** may arrive to the arrival zone **148** via the cable **23** and interact with the attachment manager **126**, as indicated by arrows **182**. The attachment manager **126** may disengage the grip **108** of the gondola arm **86** from the cable **23**, and position the grip **108** onto the arm carrier **128**. In some embodiments, the cable **23** may continue along, or adjacent to, the arm carrier **128**. Once disposed on the arm carrier **128**, the gondola arm **86** may disengage from the gondola attachment **64** of the vehicle **14**. Once disengaged, the vehicle **14** may exit the gondola station **20**, as indicated by arrows **184**. Further, once the vehicle **14** is disengaged from the gondola arm **86**, the gondola arm **86** may be motivated along the arm carrier **128** by the drive elements **130**. Specifically, the gondola arm **86** may be positioned at the departure zone **120** to couple to a different vehicle **14**. Indeed, vehicles **14** may arrive to the gondola station **20** via a path separate from the arrival zone **148**, as indicated by arrows **186**. The vehicles **14** that arrive at the gondola station **20** may drive to the departure zone **120**, as indicated by arrows **188**, where the vehicles **14** will couple to the gondola arm **86**. Once coupled to the gondola arm **86**, the gondola arm **86** and the vehicle **14** may move further along the arm carrier **128** (e.g., in response to the vehicle motor **48** and/or the arm carrier **128** drive elements **130**) where the grip **108** of the gondola arm **86** will interact with the attachment manager **126**. Specifically, the attachment manager **126** may cause the grip **108** to couple to the cable **23**. Once coupled to the cable **23**, the cable **23** may pull the gondola arm **86** and the vehicle **14** along the gondola path **18** out of the gondola station **20***a*, as indicated by arrow **190**.

In some embodiments, a vehicle **14** may arrive to the arrival zone **148**, maintain engagement with the gondola arm **86** as the gondola arm **86** moves along the arm carrier **128**, and continue to the departure zone **120**, where the vehicle **14** will continue along the gondola path **18**. Further, in some embodiments, the gondola station **20***a* may be disposed between two separate gondola paths **18**. For example, in some embodiments, the gondola station may include a first bull wheel **21** configured to motivate the cable **23** through a first gondola path **18***a*. The gondola station **20** may further include a second bull wheel **21***b* configured to motivate the cable **23** through a second gondola path **18***b*. In this manner, in some embodiments, the first gondola path **18***a* may be positioned at an angle relative to the second gondola path **18***b*.

Discussion of the embodiments illustrated in FIGS. **7-12** may have focused on specific embodiments of the gondola attachment **64**, the gondola arm **86**, the vehicle compartment **112**, or a combination thereof in order to provide concise explanation of the embodiments. However, it is to be understood that the gondola stations **20** of FIGS. **7-12** may include any combination of the gondola attachment **64**, the gondola arm **86**, and/or the vehicle compartment **112**, such as is shown in FIGS. **3-6**.

Moreover, as discussed herein, certain embodiments of the autonomous vehicle transportation system **12** may rely on engaging with either the gondola arm **86** and/or the vehicle compartment **112** in order to engage the vehicle **14** with the gondola system **16**. To this end, in some embodiments, the controller **40** may determine the location of each of the vehicles **14** (e.g., via the sensors **58**) and may provide a corresponding number of gondola arms **86** and/or vehicle compartments **112** at the appropriate gondola stations **20** to facilitate travel of the vehicle **14** via the gondola system **16**. For example, the destination of the vehicle **14**, which may be received through the user input **60**, may require utilization of one or more specific gondola stations **20**. Accordingly, the controller **40** may send one or more signals to the gondola system **16** such that the gondola system **16** transfers a suitable number of gondola arms **86** and/or vehicle compartments **112** to the appropriate gondola station **20** to facilitate efficient travel of the vehicle **14** to its destination. In other words, the controller may ensure that each gondola station **20** to be used in the vehicle's **14** travel includes a suitable number of gondola arms **86** and/or vehicle compartments **112** so that vehicles **14** do not wait an excessive amount of time at the gondola stations **20** to utilize the gondola system **16**.

Overall, the autonomy of the vehicles **14** may greatly facilitate travel through the gondola system **16**. Indeed, as discussed herein, engagement between the vehicles **14** and the gondola system **16** may require precise control of the vehicle **14**. Accordingly, the autonomy of the vehicles **14** may provide the precise control to utilize the gondola system **16**. However, it is to be understood that in some embodiments, the vehicles **14** may be non-autonomous vehicles **14**.

While only certain features have been illustrated and described herein, many modifications and changes will occur to those skilled in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the disclosure.

The invention claimed is:

1. An amusement park transportation system comprising:
- a plurality of separated park areas;
- an autonomous vehicle configured to drive along ground surface vehicle paths within the plurality of separated park areas, the autonomous vehicle comprising a gondola attachment integrally coupled to a roof of the autonomous vehicle;
- a gondola system configured to transport the autonomous vehicle between the separated park areas, the gondola system comprising a gondola arm and a locking device coupled to an end of the gondola arm, the locking device configured to engage with the gondola attachment; and
- a control system configured to operate the autonomous vehicle to:
  - engage with the locking device of the gondola system via the gondola attachment to secure the autonomous vehicle to the gondola system to facilitate transport of the autonomous vehicle between the separated park areas by the gondola system; and
  - disengage the locking device of the gondola system from the gondola attachment to allow the autonomous vehicle to drive along the ground surface vehicle paths within at least one separated park area of the plurality of separated park areas.

2. The amusement park transportation system of claim **1**, wherein the gondola system comprises a plurality of gondola stations configured to facilitate engagement or disengagement of the autonomous vehicle to or from the gondola system, and wherein the autonomous vehicle is configured to drive along the ground surface vehicle paths separately from the plurality of gondola stations.

3. The amusement park transportation system of claim **2**, wherein a gondola station of the plurality of gondola stations comprises a guide rail configured to contact a side of the autonomous vehicle to guide the autonomous vehicle to an engagement position within the gondola station.

4. The amusement park transportation system of claim **2**, wherein a gondola station of the plurality of gondola stations comprises a sub-surface positioning system disposed beneath a surface of a gondola drive path and configured to contact wheels of the autonomous vehicle to guide the autonomous vehicle to an engagement position within the gondola station.

5. The amusement park transportation system of claim **1**, comprising a controller of the control system, wherein the controller is configured to:
- receive a first signal indicative of a first location of the autonomous vehicle;
- receive a second signal indicative of a second location from a user interface of the autonomous vehicle; and
- provide a third signal to a vehicle controller of the autonomous vehicle to cause the autonomous vehicle to travel from the first location to the second location.

6. The amusement park transportation system of claim **5**, wherein the first location is disposed in a first park area, and the second location is disposed in a second park area that is geographically separate from the first park area, and wherein, based on the third signal, the vehicle controller is configured to cause the autonomous vehicle to engage with the gondola system to travel from the first location to the second location.

7. The amusement park transportation system of claim **6**, wherein the first park area is geographically separated from the second park area by one or more obstacles, and wherein the one or more obstacles comprises a public roadway, a body of water, a land form, or a combination thereof.

8. An autonomous vehicle transportation system, comprising:
- a gondola system configured to provide a gondola path between at least two separated park areas, the gondola system comprising a gondola arm and a locking device coupled to an end of the gondola arm;
- a vehicle configured to at least partially autonomously drive along surface vehicle paths of ground surfaces within the separated park areas and comprising a gondola attachment integrally coupled to a top portion of

the vehicle, wherein the gondola attachment is configured to support a weight of the vehicle, and wherein the gondola attachment is configured to:

engage with the locking device of the gondola system to allow the gondola system to carry the vehicle along the gondola path from a first area of the at least two separated park areas to a second area of the at least two separated park areas; and

disengage from the locking device of the gondola system to allow the vehicle to move along a portion of the surface vehicle paths of ground surfaces within the second area; and

a controller configured to maneuver the vehicle into an engagement position relative to the gondola.

9. The autonomous vehicle transportation system of claim **8**, wherein the gondola attachment comprises a convex surface, wherein the locking device coupled to the end of the gondola arm comprises a concave surface, and wherein the convex surface of the gondola attachment is configured to move along the concave surface of the locking device to facilitate engagement between the vehicle and the gondola system.

10. The autonomous vehicle transportation system of claim **8**, wherein the vehicle comprises wheels configured to drive the vehicle along the surface vehicle paths of ground surfaces, wherein the gondola attachment is configured to engage with the gondola arm based on a position of the wheels.

11. The autonomous vehicle transportation system of claim **10**, wherein the wheels are configured to switch between a retracted position and an extended position, and wherein movement from the retracted position to the extended position is configured to cause the locking device to engage with the gondola arm.

12. The autonomous vehicle transportation system of claim **8**, wherein the gondola attachment comprises a gondola arm integrally coupled to the top portion of the vehicle, and wherein the gondola arm comprises a grip configured to engage with a cable of the gondola system.

13. The autonomous vehicle transportation system of claim **8**, wherein the vehicle comprises a seat configured to support a passenger.

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